Olympic Region, Area 3
Integrated Roadside Vegetation Management Plan

2009

Washington State Department of Transportation
Maintenance and Operations Division

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Summary

This plan explains the Washington State Department of Transportation's (WSDOT) Guidelines for maintenance of roadside vegetation for Maintenance Area 3 within the agency's Olympic Region. This area manages vegetation within approximately 260 miles of state highway corridor, in Clallam and Jefferson Counties. The area includes some of the most scenic highways in the state. State Route (SR) 112 is designated as National Scenic Byway. The northernmost loop of United States (US) 101 through Jefferson and Clallam Counties travels through two sections of the Olympic National Park. Major cities within the area boundaries include Port Angeles/Sequim, Port Townsend, and Forks. A map of the area is included as **Figure 1** on the following page.

The primary objectives in maintenance of roadside vegetation within the area are in relation to safety of the highway users, preservation of the highway infrastructure, and control of legally designated noxious weeds where they occur on the right of way. Other considerations include protection and preservation of natural environment, preserving and enhancing the natural scenic quality of the roadside, and being a good neighbor to the many adjoining property owners. In all cases, roadside vegetation maintenance activities are planned and conducted in a way that discourages or eliminates unwanted vegetation and promotes desirable vegetation. This is the basic premise of Integrated Vegetation Management (IVM) and the foundation of the program.

This document and associated information management tools serve as the primary reference for maintenance of roadside vegetation in the area. Included is detailed information on agency, region, and area practices along with locations for planned routine maintenance practices, high-priority noxious weed infestations, sensitive areas, and other areas with special management considerations. Also included are guidelines and prescriptions for best management practices in dealing with roadside vegetation problems and opportunities. In effect, this plan supports WSDOT's compliance with state law (RCW 17.15) by implementing the principles of Integrated Pest Management for the management of roadside vegetation. It also supports WSDOT's long-range goals for the management of roadsides to:

- Create naturally stable, sustainable plant communities
- Improve effectiveness and efficiency in the control of weeds and unwanted trees and brush
- Reduce maintenance cost and herbicide use over time

This plan is organized around the major categories of roadside vegetation maintenance work. The major categories include: Zone 1 (or pavement edge maintenance), Routine Mowing, Noxious Weed Control, Nuisance Weed Control, Tree and Brush Control, and Special Maintenance Areas.

The management of roadside vegetation is a dynamic process and it is intended that this plan be continuously adapted over time based on input from a variety of sources. An integral component of the process is a database for recording IVM treatments for specific vegetation controls and locations, and to record information on follow up evaluation on these treatments. Annual area meetings will be held to discuss what is learned each year and refine the plan over time.

WSDOT is also requesting that local public and private entities with an interest in weed control and roadside vegetation management provide input on the plan and cooperate in efforts where appropriate. Additional copies of the draft plan are available online: www.wsdot.wa.gov/maintenance/vegetation/mgmt_plans.htm, hard copies can also be provided upon request. Please contact Bill Riley or Ray Willard at the numbers listed below for questions or comments:

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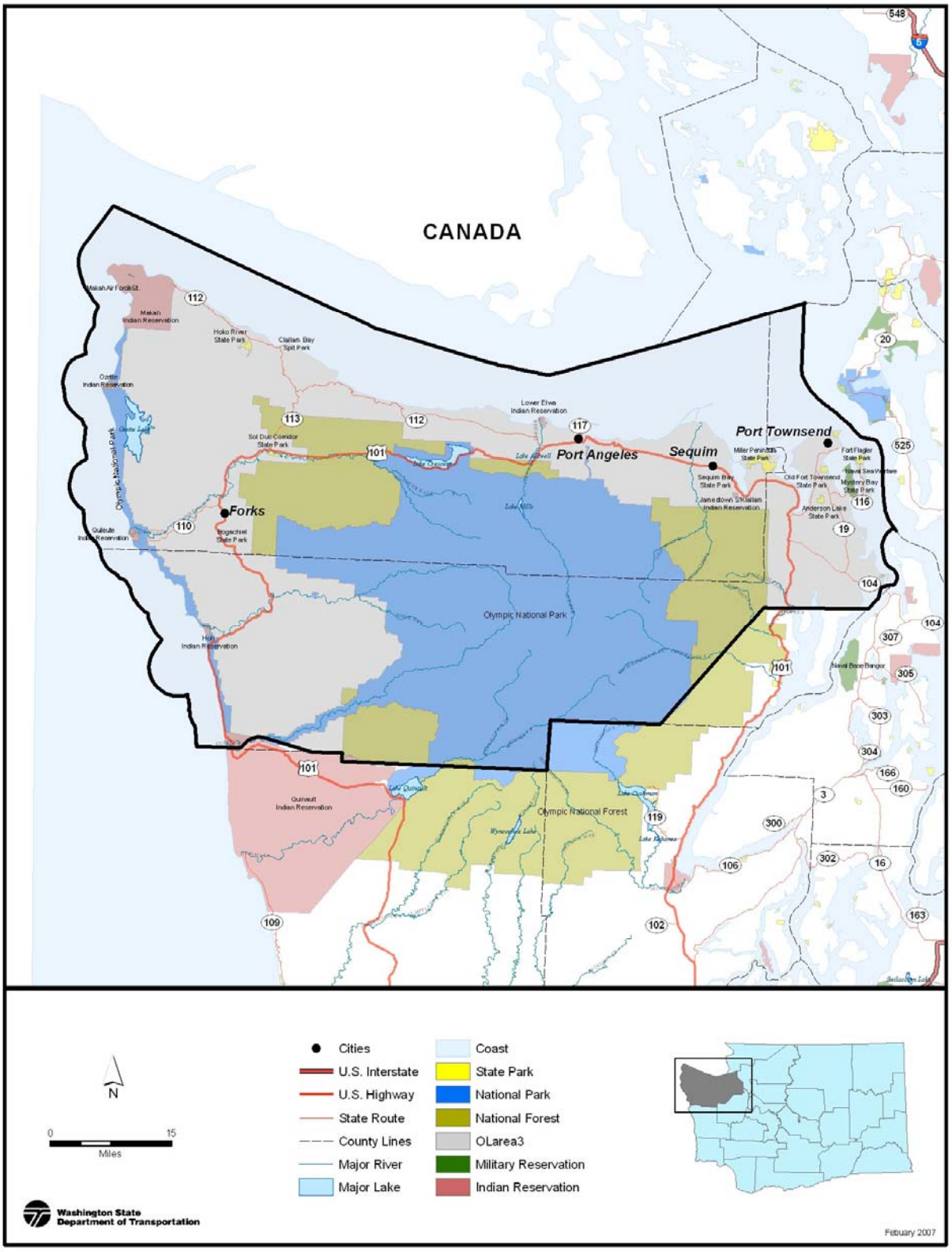


Olympic Region, Area 3 Map
Figure 1

Roadside Management Considerations

The primary objectives for maintenance of roadside vegetation are to provide for safe highway operation and to comply with legal regulations for control of noxious weeds and protection of the environment. Overall WSDOT maintenance policy and procedures for roadside vegetation are defined in Chapter 6 of the WSDOT Maintenance Manual (M51-01, March 2002) www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/MaintenanceManual.pdf

Visual Quality
It is also important to maintain appropriate visual standards in the appearance of the roadside. This is particularly important in Area 3, with much of the local economy dependent on the tourist industry. All maintenance activities will be conducted in a way that minimizes visual impacts such as wide spread "brown-out" from herbicides or shattered limbs from side trimming. Roadsides should look as natural as possible throughout the year. Appropriate visual quality for roadsides throughout the state is defined in the WSDOT Roadside Classification Plan (June 1996) www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/RCP.pdf

Operational Zones
WSDOT roadsides are divided into several zones for the purposes of assigning management objectives, maintenance needs, and thresholds for triggering vegetation maintenance actions. Noxious weed species designated for control by state and county law are controlled throughout all zones. Not all management zones occur along all state highways. In some cases the narrow width of the right-of-way or adjoining land-use, limits the operational zones to Zone 1 and/or a narrow Zone 2 only. Roadside vegetation management zones are illustrated in **Figure 2** below and defined as follows:

> **Zone 1** – A vegetation free gravel shoulder, where needed, is maintained as a one to three-foot wide strip to provide for key maintenance, operational, safety, and pavement and guardrail preservation needs. Zone 1 is typically maintained with an annual application of herbicides. In Olympic Region, Area 3, Zone 1 is maintained under guardrails only.
>
> **Zone 2** – The operational zone extends from the edge of Zone 1 or the pavement edge (if Zone 1 is not present) to a width necessary to provide for safe errant vehicular recovery, maintain sight distance at corners and intersections, and provide for other operational, safety, and environmental functions. Zone 2 is typically maintained by mowing a single pass adjacent to the pavement and through selective removal of unwanted trees and brush beyond the mowing strip.
>
> **Zone 3** – In areas with sufficient right-of-way width, a buffer or transition zone extends from Zone 2 to the right-of-way line to provide a buffer or transitional area between the highway facility and adjacent land uses. This area is maintained selectively, and to the greatest degree possible as a self-sustaining plant community, to minimize erosion as well as the growth of weeds and undesirable trees and brush.

Roadside Maintenance Activities
All roadside maintenance activities are planned and conducted in a way that discourages or eliminates unwanted vegetation and promotes desirable vegetation; this is the basic premise of Integrated Vegetation Management. In every case it is essential that the results of maintenance activities are evaluated and actions are annually adjusted as necessary to maximize efficiency and effectiveness. However, in some cases maintenance activities are conducted routinely on an annual basis, such as herbicide application for maintenance of Zone 1 and annual mowing where required.

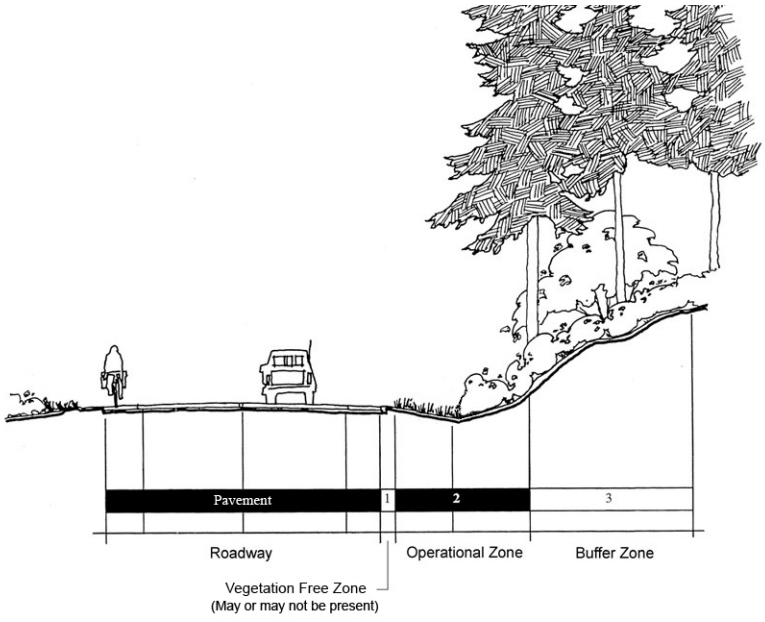
> **Routine Maintenance Activities** – When vegetation maintenance activities are required to keep the area of roadside being treated in an annually controlled condition, activities are considered routine. This is more critical for areas of vegetated roadside near the travel lanes, edge of pavement, and around guardrails and other hardware. This plan

provides prescriptions and gives locations for routine maintenance activities including maintenance of Zone 1 and annual mowing.

Integrated Vegetation Management Activities – Although all activities are to be planned and conducted in accordance with the principles of IVM, many vegetation maintenance activities are intended to target a specific type or types of unwanted plants. By carefully planning and precise execution of these target specific activities over time it is possible to establish desirable vegetation, which will prevent the re-infestation of unwanted plants and reduce the need for maintenance over time. The process for determining and carrying out IVM actions is illustrated in **Figure 3** on the following page. This plan document provides information, locations, and gives prescriptions for selective control of weeds and other unwanted vegetation and for the promotion and establishment of desirable vegetation. Further information and guidance on the application of IVM is available in the document Integrated Vegetation Management for Roadsides (WSDOT, July 1997) www.wsdot.wa.gov/maintenance/pdf/IVM.pdf

Special Maintenance Areas – In some locations there are unique situations that require special consideration in determining appropriate vegetation maintenance actions. Examples of these are: environmentally sensitive areas, areas with special neighbor concerns, areas where a higher level of maintenance is expected such as gateway interchanges or formally landscaped areas, or in some cases along highways that cross tribal or federal lands. This plan provides information and guidance on the locations and unique requirements or restrictions on maintenance activities in all of these situations throughout the area.

Herbicide Use – WSDOT has conducted independent research on herbicide risk from toxicity and environmental fate, based specifically on agency application methods and use rates. Findings from this research have been used to establish an approved palette of herbicides and application limits for state highways. A complete summary of herbicides approved for use on WSDOT rights of way is included in **Appendix B**.

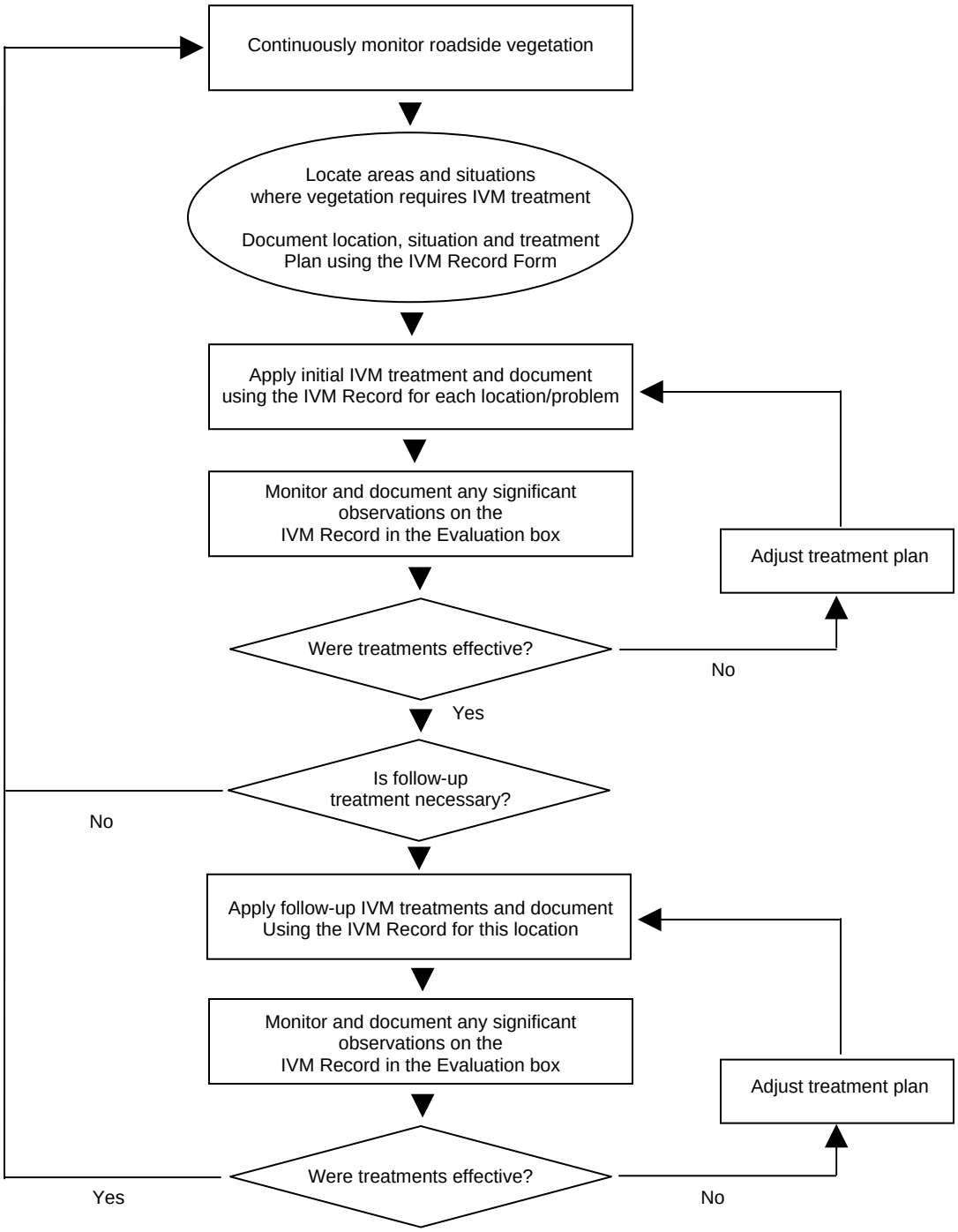


Vegetation Free Zone
Gravel Shoulder
Maintained in designated locations using mechanical and chemical methods for sight distance, to improve drainage, and to preserve pavement and roadside hardware.

Operational Zone
Low Vegetation
Maintained with mowing and IVM treatments for sight distance, safe errant vehicle recovery, and weed control.

Buffer Zone
Native/ Natural Vegetation
Where adequate right of way exists, maintained using IVM to encourage desirable vegetation in self-sustaining plant communities.

Typical Roadside Vegetation Management Zones
Figure 2



The IVM Decision-Making Process
Figure 3

Area IVM Goals

The purpose of this section is to identify the highest priority work activities for roadside vegetation management in Olympic Region, Area 3 in relation to Maintenance Accountability Process (MAP) activity groups and specified service level targets. In addition to the mowing and Zone 1 maintenance activities routinely accomplished on an annual basis in the area, these goals are intended to serve as a work plan for crews. Priorities are listed by specific activities and locations in relation to the three major MAP groups for roadside vegetation maintenance performance: Control of Vegetative Obstructions, Noxious Weed Control, and Nuisance Weed Control. This section of the plan is intended to supplement the information in the following section, ***Olympic Region, Area 3 – Roadside Vegetation Management Plan*** which details the guidelines and methods for accomplishing the work of roadside vegetation management.

Control of Vegetative Obstructions

Since the work of this group of maintenance activities relates to the safety and operation of the highway, these items are considered first priority in terms of the overall roadside maintenance priority. The primary activities for control of obstructions are annual mowing and trimming along the edges of all highway pavements, and applying herbicides to control vegetation around guardrail and maintain vegetation-free strips along designated road sections. Beyond this, activities and locations of greatest need include:

- Cut and stump treat alder on cut slopes along SR112, MP 10-20 and 35-36
- Selectively control undesirable trees emerging in recently reclaimed areas along SR104

Noxious Weed Control

Noxious weeds are those species legally designated by state and county regulations for required control by all property owners. Because laws provide for fines and/or control work and billing of property owners by county administration, work under this group is considered second priority after critical safety related locations have been addressed. The majority of noxious weed control activities are conducted by crews patrolling the roadsides and treating visible weeds as they emerge each year, or in response to County weed board notices. In addition to this work, actions and locations designated as focus areas for eradication over the next several years due to reoccurring infestations include:

- Treat giant hogweed with glyphosate in a backpack sprayer, US101 MP 274.20
- Treat European hawkweed with Transline in a backpack sprayer, US101 MP 213.7-214.5 and 217.8-218
- Treat yellow hawkweed with Transline in a backpack sprayer, US101 MP 215.9-216 and 172.4-172.9, and SR110 MP. 9.5-9.7
- Treat orange hawkweed with Transline in a backpack sprayer, US101 MP 160.4-160.6 and 181.2-181.7
- Hand pull tansy throughout the area when in bloom, cut and bag seed heads if present
- Treat poison hemlock prior to bolt with Escort, SR20 MP 9-10, SR19 MP 4.4-12.5 in various spots, SR104 MP 9.9, US101 MP 259.6, 261.7, 264.2, 266.8 and 270 to 270.2.
- Treat yellow hawkweed with Transline, SR104 MP 6-7
- Treat orange hawkweed with Transline, US101 MP 234.4-234.6
- Treat meadow knapweed with Transline, SR112 MP 45.8-46.2
- Treat diffuse knapweed with Transline, US101 MP 260-267

Nuisance Vegetation Control

Nuisance vegetation control includes control/management of weed species that are recommended but not mandated, by state and county law. It also includes work such as mowing of grass and weeds in areas where a more neatly maintained appearance is desired such as in gateway interchanges or highways in urbanized areas. Because nuisance vegetation control is lower priority after safety related and legally mandated activities, the location and work actions listed below may be postponed depending on availability of resources.

- Control knotweed in late summer with glyphosate and imazapyr, US101, MP 185.85(right), 202.5(left), and 206
- Control knotweed in late summer with glyphosate and imazapyr, SR110 around ends of Bogachiel Bridge, MP 8.64
- Control teasel with Transline, US 101, MP 264.5 and 281.3
- Monitor scotch broom growth at the US101/SR104 interchange and retreat with the Brown Brush Monitor and Garlon as necessary. If only sparse re-growth of broom occurs spot treat only with Garlon.

1. ROUTINE MAINTENANCE ACTIVITIES

Roadside maintenance activities are considered routine when regular periodic treatment is required to keep vegetative growth from interfering with highway safety and operation. Routine vegetation maintenance activities are typically required adjacent to the edge of pavement or within the Operational Zone.

1.1. Maintenance of a Vegetation-Free Zone at the Edge of Pavement

Over the past several years WSDOT has been conducting a formal research project to evaluate long-term benefit/cost resulting from alternative approaches for maintenance of vegetation at the edge of pavement. Past policy and practice will be refined over the coming years in response to findings from this study. For the 2009 growing season, vegetation at the edge of pavement will be managed as follows on roadsides in Olympic Region, Area 3:

1.1.1. Guidelines

- A vegetation-free zone at the edge of pavement is referred to as Zone 1
- In Olympic Region, Area 3, Zone 1 is maintained only under guardrail in locations as indicated in this plan.
- If no vegetation-free zone is maintained in a given location, then Zone 2 begins at the edge of pavement.
- Annual Zone 1 treatments are intended to remove and/or prevent all vegetation growth in a solid band adjacent to the pavement edge. Limited re-growth of grasses and other non-weed species in the year following each treatment is acceptable.
- Zone 1 is maintained with the annual application of herbicides under all guardrail installations and throughout the area.
- Where guardrail comes within 10' of water at bridge abutments and stream crossings, treatments will be made with a backpack sprayer or hand-gun and hose reel while on foot.

1.1.2 Methods

- Zone 1 is maintained using an annual application of non-selective, post-emergent herbicides where vegetation re-growth is thick. In areas where mostly bare-ground is still present, pre-emergent herbicides may be added to the mix through the spray injection system.
- Applications typically occur beginning mid-May depending on weather patterns and plant growth.
- Pavement edges will be monitored for surface drainage problems resulting from sod build-up and will be graded in select locations as necessary to allow storm water flow off the roadway surface.
- See **Appendix A, Routine Maintenance Prescriptions, Zone 1 Maintenance**

1.1.3 Locations

- Zone 1 is maintained only under guardrail in this area as shown in **Appendix C, Zone 1 Map**

1.2. Routine Mowing/Trimming (Zone 2)

1.2.1. Guidelines

- Routine annual mowing of roadside grass stands occurs throughout the area in at least one pass, at least once per year immediately adjacent to the edge of pavement, to prevent vegetation from encroaching on traffic operations.

- Additional annual mowing or trimming will be conducted throughout the growing season as needed for select locations to preserve site distance at curves, intersections and any other highway entry points.
- In areas beyond the single mowing pass, mowing is only used occasionally as part of planned IVM treatments for target specific weed and/or tree and brush control as described below in **Section 2**.
- Other areas that may be routinely mowed include grass areas in park and ride lots, narrow grass strips along sidewalks in urban areas, and fence-lines adjacent to neighboring properties as deemed necessary by the Area Superintendent.

1.2.2. Methods

Mowing

- Timing and mowing heights are set to encourage root development and health of the grass stands.
- Single pass mowing consists of one pass up to the maximum width of mowing equipment but may be as narrow as practical depending on mowing equipment, the presence of existing visual lines such as ditches, and the configuration of roadside cut and fill slopes.

Trimming

- Whenever possible, side arm brush trimming will be conducted as late in the season as possible or even through the winter months if time allows, to avoid negative visual impacts during the tourist season. Early trimming in late winter or early spring, prior to leaf out is appropriate when soil and weather conditions permit.
- Chemical control methods on evergreen trees or foliar applications to other undesirable vegetation will occur after mid September to avoid brown outs and potential contact with edible berries.
- See **Appendix A, Routine Maintenance Prescriptions, Zone 2 Maintenance**

1.2.3. Locations

- Routine single pass mowing occurs throughout the area each year as necessary.

1.3. Hazard Tree Removal

1.3.1. Guidelines

- Hazard tree removal is considered a routine maintenance activity because maintenance is constantly on the look out for any trees that pose an imminent threat to the highway or traffic.
- Whenever hazard trees are identified they are routinely removed as soon as possible.
- Hazard trees may be dead, leaning, or structurally unsound. Best horticultural judgment will be used in evaluating trees that appear diseased or structurally unsound or are believed to pose a long-term threat to determine the best course of action.
- Another consideration in removal of trees is the contribution to shading in areas prone to frost and ice formation on the highway surface. When such areas are identified, the surrounding canopy may be thinned through selective removal of large trees on the right of way.

1.3.2. Methods

- Hazard trees are removed in such a manner to minimize damage and impact to the highway structure and to other healthy trees and under-story vegetation.

2. INTEGRATED VEGETATION MANAGEMENT ACTIVITIES

For all vegetation management needs not addressed through routine maintenance as described above, activities are planned and carried out using the principles of Integrated Vegetation Management (IVM) and the decision making process diagrammed on Page 5 in **Figure 3**. IVM is a coordinated decision making process that uses the most appropriate vegetation management methods and strategy, along with a monitoring and evaluation system, to achieve long term roadside maintenance goals and objectives in an environmentally and economically sound manner. The goal in utilizing the IVM approach is the effective control of unwanted vegetation and the establishment of stable, low maintenance native or naturalized plant communities that are compatible with:

- Highway maintenance and safety objectives.
- Preservation of environmental quality.
- Weed control requirements.
- The concern's of WSDOT's customers and neighbors.

Long term, the use of the IVM approach can reduce the intensity and cost of maintenance, as well as minimizing the need to use herbicides.

2.1. Integrated Vegetation Management Planning and Tracking Database

2.1.1. Guidelines

- An Integrated Vegetation Management Records database is available for use. This database is accessed through the same WSDOT network application as the Pesticide Application Records database.
- Any activities focused on treatment of a specific location and species infestation, or focused on treatment of any types of unwanted vegetation throughout the area will be documented with an initial IVM record outlining the long-term treatment plan. These same records will be updated over time whenever planned treatments are carried out, or when observations are made as to the success or failure of past treatments.
- Treatment records may be printed out and inserted into **Appendix F** of plan binders for reference.

2.2. Noxious Weed Control

2.2.1. Guidelines

- Noxious weed control is a high priority for WSDOT because of state law requiring control of designated species (RCW 17.10). Transportation rights of way are high priority locations for control of noxious weed species within the state because they cross and link so many adjacent properties and land uses and can act as conduits for the spread of weeds.
- Whenever possible treatment of designated noxious weed species and infestations locations will be treated following prescriptions as defined in this plan and documented with IVM record forms in the database.
- Washington State Law classifies noxious weeds in three classes: A, B, and C. All Class A species are required control wherever they occur statewide. The law allows for individual county weed boards to designate individual Class B and C weeds for control within the counties depending on how widespread and potentially harmful they are at the local level.
- For the purposes of this plan, noxious weeds are defined as species within any class designated or prioritized by the weed boards for control on state highway rights of way within the counties managed by this area.
- The weed lists for Clallam and Jefferson Counties are similar and for the purposes of this plan the lists below will apply area-wide:

Class A
Class A noxious weeds are non-native species with a limited distribution in the state. The following Class A noxious weeds are known to exist on WSDOT right of way in Olympic Region, Area 3:

Common Name/*Botanical Name*
Giant hogweed/*Heracleum mantagazzianum*
European hawkweed/*Hieracium sabaudum*

Class B
Class B weeds are more widespread than Class A, with control mandated by law only if infestations are generally limited and the species are designated within the individual counties by the County Noxious Weed Control Boards. The following designated Class B species are known to exist on WSDOT right of way in Olympic Region, Area 3:

Common Name/*Botanical Name*
Dalmation toadflax/*Linaria dalmatica ssp. dalmatica*
Hoary alyssum/*Berteroa incana*
Meadow knapweed/*Centaurea jacea x nigra*
Orange hawkweed/*Hieracium aurantiacum*
Poison hemlock/*Conium maculatum*
Common Reed/*Phragmites australis*
Purple loosestrife/*Lythrum salicara*
Spotted knapweed/*Centaurea stoebe*
Sulfur cinquefoil/*Potentilla recta*
Tansy ragwort/*Senecio jacobaea*
Wild chervil/*Anthriscus sylvestris*
Yellow hawkweed/*Hieracium caespitosum*

Special Designations
Due to problems with noxious weed seed distribution from material moved from pit sites, Clallam County has designated two additional species for required control in pit sites. These species are considered nuisance weeds by WSDOT in non-pit sites in the area.

Common Name/*Botanical Name*
Scotch broom/Cytisus scoparious
Tansy ragwort/Senecio jacobaea

Class C
Class C noxious weeds are widely established throughout Washington or may impact the agricultural industry. Counties may require control of certain Class C weeds at their own discretion. Unless otherwise required, WSDOT classifies Class C species as “nuisance” weeds and provides control as part of the general roadside vegetation management program. Nuisance weeds and treatment options are described in Section 2.4 of this document.

- Pictures of designated control noxious weeds are included for reference in **Appendix D**.

2.2.2. Methods

- Because noxious weed species are often difficult to control, herbicides treatments are often the primary, initial means of control.
- If infestations are limited to a few plants, hand pulling is also effective when the entire root system is also removed. Maintenance employees are encouraged to be aware of and look for new noxious weed occurrences, and to stop and pull these plants whenever possible.
- In conjunction with weed control treatments, a variety of other measures may be taken to promote natural vegetative competition through seeding, planting, and soil enhancement. The IVM Record and database are essential to tracking the execution and success of these control measures.
- For recommended treatments specific to noxious weed species, see **Appendix A, IVM Prescriptions, Noxious Weed Control**

2.2.3. Locations

- **Appendix D, Noxious Weed Location Map** shows locations where the most critical reoccurring infestations of noxious species exist in Olympic Region, Area 3. There are a number of noxious weed locations not currently mapped, the list of locations will be added to and updated annually.

2.3. Nuisance Weed Control

2.3.1. Guidelines

- For the purposes of this plan, nuisance weed species are defined as species listed as Class B and C weeds on the state noxious weed lists, but not required for control within individual counties.
- There is one weed species in the area that is not on the state's noxious weed list but is known to be a highly invasive non-native. **Common teasel/*Dipsacus fullonum*** is only present in two locations on the right of way in the area and is therefore being considered a priority control nuisance weed.
- Nuisance weed control, while not required by state law, provides many positive benefits to the overall condition of the roadside, enhances ecological function by maintaining and enhancing native plant communities, reduces the potential for continuing spread of weed infestations, and enhances visual quality.
- Nuisance weed species will be controlled when time and budget allows.
- Priority will be given to locations with the highest chance for success including relatively new infestations and where there is potential for infestations to spread to un-infested areas of the right of way or to un-infested neighboring properties.
- Species designated as nuisance weeds in Olympic Region, Area 3 that are known to exist on the highway right of way include:

Common Name/Botanical Name
Scotch broom/*Cytisus scoparius*
Himalayan blackberry/*Rubus discolor*
Knotweed sp./*Polygonum sp.*
Canada thistle/*Cirsium arvense*
Bull thistle/*Cirsium vulgare*
Common fennel/*Foeniculum vulgare*
Common teasel/*Dipsacus fullonum*

- Pictures of nuisance weeds are included for reference in **Appendix D**.

2.3.2. Methods

- Control measures for nuisance weed are dependent on the type of plant.
- Knotweed sp. where occurring within normally mowed areas will be mowed around and treated with herbicides late in the season, as resources allow.

- Woody species such as Scotch broom and Himalayan blackberry are most effectively treated with a combination of cutting, herbicide treatments and encouragement of native vegetation.
- Perennial species such as Canada thistle are most effective controlled by succeeding years of properly timed herbicide applications.
- Annual or biennial species such as bull thistle and common tansy may also be effectively controlled with herbicide applications when plants are in the rosette stage in spring, or by hand pulling prior to seed set.
- See **Appendix A, IVM Prescriptions, Nuisance Weed Control**.

2.3.3. Locations

- Locations for priority nuisance weed control activities will be identified in the **Area IVM Goals** section of the plan beginning on Page 9.

2.4. Tree and Brush Control

2.4.1. Guidelines

- Trees and brush are controlled for safety reasons including preservation of sight distance at curves and intersections, and for visibility of signs, and preventing trees with large trunk diameter from growing too close to traffic lanes.
- Native shrub and small tree species should be allowed to grow and mature in Zone 2 and selectively trimmed if they begin to encroach on site distance or other traffic operational requirements.
- Large tree species left to grow in Zone 2 and in some cases parts of Zone 3, can reach substantial size over a relatively short period of time and causing a hazard either to errant vehicle recovery, contributing to shading and winter ice formation.
- Fast-growing pioneer species such as big leaf maple, alder, or cottonwood, present a risk from falling on the road when mature. Wherever these trees emerge within 70' of the pavement on highway right of way, they should be removed within the first two to three years of growth or as soon as possible after they emerge.
- Any tree with a trunk diameter of 4" or greater is considered a hazard for errant vehicles in Zone 2 and should be removed when young. The Design Clear Zone and is typically maintained to a width of 30' from the traffic lane edge where guardrail or concrete barrier does not exist. Actual minimum widths are determined by roadway alignment, traffic speed and volume, and cross-section of the roadside. Clear Zone widths are specified in the WSDOT Design Manual, Chapter 700.04.
  www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/DesignManual.pdf

2.4.2. Methods

- Removal of undesirable tree and brush species is typically accomplished by properly timed selective mowing, properly timed herbicide applications, hand cutting, hand pulling, or combinations thereof.
- In some locations it is most effective to mow back the majority of the existing vegetation and then selectively treat undesirable re-growth with herbicides in succeeding years, allowing desirable vegetation to grow up around and form a competitive cover.
- In some cases when tree and brush species are cut by hand, the debris can be fed through a chipper and placed back on the roadside in the form of mulch for soil enhancement and weed prevention.
- Timing of activities has a significant effect on how the vegetation grows back. Herbicide applications made by hand, directly to the cut surfaces of undesirable plants may be used to reduce or eliminate grow back.
- Chemical control methods will not be used on conifers greater than 2 feet in height and/or large dense patches of seedling trees, to avoid unnecessary negative visual impacts from "brown-out".
- Chemical control methods will not be used on deciduous trees and shrubs until after the first of September, except for as stump treatments in conjunction with mechanical cutting to eliminate grow-back.
- When possible, safe and practical, seedling of desirable trees may be dug or pulled by hand and transplanted to areas where there growth will be beneficial and appropriate. Agreements may be signed to allow private citizens to collect seedlings for use as transplants.
- See **Appendix A, IVM Prescriptions, Tree and Brush Control**.

3. SPECIAL MAINTENANCE AREAS

Special Maintenance Areas are any locations with unique maintenance requirements or special considerations for roadside management. These areas may include interchanges, community entrances or enhancement areas, areas maintained by cities, bicycle paths, storm water retention ponds, state park land, wellheads, environmentally sensitive areas, school zones and roadsides adjacent to individual properties with current or annual no-spray agreements.

3.1. Interchanges/Intersections

3.1.1. Guidelines

- Interchange areas are sometimes developed to a greater level than general roadside areas to include storm water management facilities, pedestrian areas, and permanent vegetation designed for screening, and visual enhancements for community entrances.

3.1.2. Locations

- Maintenance considerations for all interchanges and key intersections are listed in **Appendix E**, along with notes describing practices for each location.

3.2. City Maintenance Areas

3.2.1. Guidelines

- In most cases where non-limited access highways exist within city limits, the roadside (all area outside the highway pavement and drainage systems) are maintained by the local city government.

3.2.2. Locations

- Areas where roadsides are maintained by cities are listed by route and begin and end milepost in **Appendix E.**

3.3. Herbicide Limited Areas

3.3.1. Guidelines

- WSDOT has identified certain areas where herbicide use will be limited to reduce any potential risk to human health or the environment. There are also areas where highways cross Federal or Tribal lands and herbicide use is restricted by the land owner's regulations.
- Herbicide applications where allowed in these areas for noxious or nuisance weed control, or in combination with mechanical methods for control of undesirable trees will be made selectively by hand.

3.3.2. Locations by Milepost

- See **Appendix E**, Special Maintenance Areas, Herbicide Sensitive Areas

3.4. Adopt-a-Highway and Owner Will Maintain Agreements

3.4.1. Guidelines

- In some locations WSDOT has signed agreements with private citizens or neighboring businesses for maintenance of roadside vegetation.

3.4.2. Locations

- Areas with existing agreements for others to maintain a portion of the roadside are listed in **Appendix E**, along with notes describing arrangements for each location.

3.5. Pit Sites and Stockpile Sites

WSDOT pit sites are often actively used for construction projects over an extended period of time and as maintenance stockpile sites. Other maintenance stockpile sites area found adjacent to the highway that are used to temporarily store maintenance sand, debris cleared from the roadway, and drainage components.

3.5.1. Guidelines

- Pit sites and maintenance stockpile sites will be managed for noxious and nuisance weeds as required.
- Maintenance stockpile sites immediately adjacent to the highway will be maintained as part of routine Zone 2 maintenance.
- For security and visual quality, vegetative screening will be used where possible to screen maintenance stockpile sites from the highway.
- Clallam County requires control of Scotch broom and Tansy ragwort in these locations.

3.5.2. Locations table by MP

- See **Appendix E**, Special Maintenance Areas, Pit and Stockpile Sites

3.6. Storm Water Management Facilities

3.6.1. Guidelines

- Storm water management facilities include bio-filtration swales, retention ponds and infiltration ponds.
- Storm water management facilities are managed for noxious and nuisance weeds, and hazard trees following the same guidelines mentioned in previous sections. The primary objectives with regards to vegetation management within these facilities are maintenance of the functionality in terms of the designed volume of retention and water flow, and the maintenance of the surrounding fence
- Trees and brush should be cleared along both sides of the perimeter fencing for a width of approximately 8 feet as needed.
- Inlets and outfalls should be kept clear of vegetation and debris.

3.6.2. Locations

- Stormwater management facilities are listed by route and milepost in **Appendix E**.

3.7. Wetland Mitigation Sites

3.7.1. Guidelines

- Wetland mitigation sites are carefully monitored through WSDOT's Environmental Services Office for up to 10 years following their creation to ensure compliance with environmental regulation.
- In most cases vegetation in these sites is planted and established through the construction and long-term monitoring process so that once they are turned over to maintenance, actions are not required unless noxious weeds or hazardous trees become an issue.
- In cases where mitigation sites have fulfilled their original permit requirements and have been turned back to maintenance, sites should be inspected on an annual basis to determine if any repairs or weed control is necessary.

3.7.2. Locations

- All wetland mitigation sites within Olympic Region, Area 3 are listed by the nearest route and milepost, and the year scheduled for turnover to maintenance, in **Appendix E**.

3.8. IVM Treatment Sites

3.8.1. Guidelines

- As discussed in **Section 2.1**, selected sites are designated for planning, carrying out and monitoring multi-year IVM treatments for control of weeds or other unwanted vegetation.
- IVM treatment sites are documented with an initial record in the IVM Treatment Database, to identify the problem to be addressed, location(s), management goals, and integrated treatment plan.
- Records are updated each time a treatment is made, results observed, or when the treatment plan is modified based on observations.

3.8.2. Locations

- All designated IVM treatment sites within Olympic Region, Area 3 are listed by the route and milepost in **Appendix E**. This list is updated annually as new sites may be added and successfully treated sites removed.

Zone 1 Maintenance - Bareground Treatment

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Gravel shoulder	Gravel shoulder	Gravel shoulder	Gravel shoulder
MANAGEMENT GOALS:	Vegetation free	Vegetation free	Vegetation free	Vegetation free
METHOD:	Annual herbicide application	Annual herbicide application	Annual herbicide application	Annual herbicide application
EQUIPMENT:	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles
MATERIALS:	Payload 8 oz./acre + Oust 3 oz./acre	Milestone VM 7 oz./acre + Round Up Pro 64 oz./acre	Round Up Pro 64-128 oz./acre	Landmark 4.5-7 oz./acre + Razor Pro 64 oz./acre
TIMING:	Early Spring or Fall	Early Spring	Early to mid June	Early Spring
IVM FOLLOW-UP:	Evaluate control	Evaluate control	Evaluate control	Evaluate control
REMARKS:	Typically applied in a 2 to 3 ft. band.			

Zone 2 Maintenance - Tree and Brush

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Conifer control	Deciduous tree and brush	Deciduous tree and brush	Deciduous tree and brush
MANAGEMENT GOALS:	Control vegetation obstruction	Control vegetation obstruction	Control vegetation obstruction	Control vegetation obstruction
METHOD:	Herbicide treatment	Herbicide treatment	Herbicide treatment	Stump Treatment
EQUIPMENT:	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Dobber or Spray bottle
MATERIALS:	Garlon 3A 128 oz. and Escort 1 oz.	Milestone VM 5-7 oz. plus Garlon 3A 64 oz.	Krenite S	Garlon 3A 50/50 with water or suf. Garlon 4 50/50 with water or suf.
TIMING:	Late summer, early fall	Late summer, early fall	Late summer before leaf turn	Anytime
IVM FOLLOW-UP:	Evaluate control	Evaluate control	Evaluate control	Evaluate control
REMARKS:	Avoid brown out by spraying late in the season and spray only to appropriate height.			

Noxious Weed Control - Giant Hogweed

	OPTION 1			
TREATMENT TYPE:	Chemical application			
ACTION THRESHOLD:	Whenever present (dependent on available resources)			
MANAGEMENT GOALS:	Eradication of noxious weed			
METHOD:	Spot treatment w/ herbicide			
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.			
MATERIALS:	Round Up 64 oz./acre			
TIMING:	Early growth stage			
IVM FOLLOW-UP:	Reapply if necessary following year. Restore site w/ native vegetation.			
REMARKS:				

Noxious Weed Control - Hawkweed sp.

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	Apply while actively growing	Apply while actively growing		
MANAGEMENT GOALS:	Eradication of listed noxious weeds.	Eradication of listed noxious weeds.		
METHOD:	Power sprayer	Power sprayer		
EQUIPMENT:	Spray tank	Spray tank		
MATERIALS:	Milestone VM 4 to 6 oz./acre	Transline .66 to 1 pint/acre		
TIMING:	Bolting stage	Bolting stage		
IVM FOLLOW-UP:	Multiple treatment as needed	Multiple treatment as needed		
REMARKS:				

Noxious Weed Control - Dalmation Toadflax

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.	As soon as plants appear.	
MANAGEMENT GOALS:	Eradication and control only if your county requires.	Eradication and control only if your county requires.	Eradication and control only if your county requires.	
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide	Spot treatment w/ herbicide	
EQUIPMENT:	Backpack sprayer or spray bottle, pickup, etc.	Backpack sprayer or spray bottle, pickup, etc.	Backpack sprayer or spray bottle, pickup, etc.	
MATERIALS:	Telar at label rates w/ silicon based surfactant at 2 to 3 oz./acre	Escort 1 to 2 oz./acre	Plateau 12 oz./acre with methylated seed oil	
TIMING:	When in bloom between June and August	When in bloom between June and August	Apply in the fall	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary. Seed and fertilize to reduce weed competition.	
REMARKS:				

Noxious Weed Control - Hoary Alyssum

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	Whenever present (dependent on available resources)	Whenever present (dependent on available resources)		
MANAGEMENT GOALS:	Eradication of noxious weed	Eradication of noxious weed		
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.		
MATERIALS:	Escort 1/2 oz./acre	Milestone VM 5 to 7 oz./acre		
TIMING:	Early growth stage	Early growth stage		
IVM FOLLOW-UP:	Reapply if necessary following year. Restore site w/ native vegetation.	Re-treat green stems as necessary. Restore site w/ native vegetation		
REMARKS:				

Noxious Weed Control - Knapweed sp.

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Manual	
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.		
MANAGEMENT GOALS:	Eradication and control if required by your county.	Eradication and control if required by your county.	Eradication and control if required by your county.	
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide is most affective.	Hand removal. Roots must also be removed. Remove plant from site.	
EQUIPMENT:	Tank sprayer where possible, backpack sprayer where necessary	Tank sprayer where possible, backpack sprayer where necessary.	Labor, transportation	
MATERIALS:	Milestone 5 to 7 oz./acre	Transline .66 to 1.33 pints/acre	none required	
TIMING:	Early budding stages	Early budding stages	Early budding stages	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary. Seed and fertilize to reduce weed competition.	
REMARKS:				

Noxious Weed Control - Poison Hemlock

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Hand removal	Chemical application	Chemical application
ACTION THRESHOLD:	When plants appear	When plants appear	When plants appear	When plants appear
MANAGEMENT GOALS:	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.
METHOD:	Spot treatment w/ herbicide	Hand removal. Remove plant from site	Spot treatment w/ herbicide	Spot treatment w/ herbicide
EQUIPMENT:	Backpack sprayer, pickup etc.	Labor, transportation	Backpack sprayer, pickup etc.	Backpack sprayer, pickup etc.
MATERIALS:	Telar 1 to 3 oz.	None required	Excort 1 to 2 oz./Phase	1 -2 percent per acre Glyphosate
TIMING:	Spray by April	Pull by April	Apply to actively growing plan	Treat at bud to full bloom stage of growth
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary	Reapply as necessary
REMARKS:	Use a nonionic surfactant or silicone surfactant			

Noxious Weed Control - Common Reed

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	
ACTION THRESHOLD:	Whenever present (dependent on available resources)	Whenever present (dependent on available resources)	Whenever present (dependent on available resources)	
MANAGEMENT GOALS:	Eradication of noxious weed	Eradication of noxious weed	Eradication of noxious weed	
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide	Spot treatment w/ herbicide	
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	
MATERIALS:	Oust 3 to 5 oz./acre	Glysophate 1 to 4 quarts/acre	Habitat 4 to 6 oz./acre	
TIMING:	Early growth stage	Early growth stage	Apply when actively growing	
IVM FOLLOW-UP:	Reapply if necessary following year. Restore site w/ native vegetation.	Re-treat green stems as necessary. Restore site w/ native vegetation	Re-treat green stems as necessary. Restore site w/ native vegetation	
REMARKS:				

Purple Loosestrife

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	Biological Agents
ACTION THRESHOLD:	whenever present	whenever present	whenever present	whenever present
MANAGEMENT GOALS:	Suppression and eradication of listed noxious weeds	Suppression and eradication of listed noxious weeds	Suppression and eradication of listed noxious weeds	Suppression and eradication of listed noxious weeds
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide	Spot treatment w/ herbicide	
EQUIPMENT:	Backpack spayer or pump can sprayer, pickup.	Backpack spayer or pump can sprayer, pickup.	Backpack spayer or pump can sprayer, pickup.	Pickup
MATERIALS:	Rodeo at 1-2 ozl/gallon, mixed with a non-ionic surfactant.	Auquaneat 4 pints/acre	Garlon 3A 6 to 8 quarts/acre	Galerucella Pusilla
TIMING:	July, August and Septemeber when mature plant appear.	July, August and Septemeber when mature plant appear.	July, August and Septemeber when mature plant appear.	During active growth
IVM FOLLOW-UP:	Monitor sites for re-growth. Reapply spot treatment as necessary.	Monitor sites for re-growth. Reapply spot treatment as necessary.	Monitor sites for re-growth. Reapply spot treatment as necessary.	Map and monitor release sites. Evaluate treatment. Establish No spray and No mow zones.
REMARKS:	Apply during actively growing at or beyond bloom stage of growth. Best results are achieved when applications are made during summer or fall months. Fall treatment must be applied before a killing frost.			

Noxious Weed Control - Sulfur Cinquefoil

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	
ACTION THRESHOLD:	When resources are available.	When resources are available.	When resources are available.	
MANAGEMENT GOALS:	Minimize populations, prevent further spread of nuisance weeds.	Minimize populations, prevent further spread of nuisance weeds.	Minimize populations, prevent further spread of nuisance weeds.	
METHOD:	Foliar treatment, mechanical.	Foliar treatment	Foliar treatment	
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary, mower.	Truck mounted sprayer where possible, backpack sprayer where necessary, mower.	Truck mounted sprayer where possible, backpack sprayer where necessary, mower.	
MATERIALS:	Crossbow 128 oz./acre	Milestone 4 to 7 VM oz./acre	Escort 1 to 2 oz./acre	
TIMING:	Spring	Spring	Spring	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize or plant to restore native plant community.	Reapply if necessary	Reapply if necessary	
REMARKS:				

Noxious Weed Control - Tansy Ragwort

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Manual	Bio-Control
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.	As soon as plants appear.	
MANAGEMENT GOALS:	Eradication and control if required by county.	Eradication and control if required by county.	Eradication and control if required by county.	Eradication and control if required by county.
METHOD:	Spot treatment w/herbicide	Spot treatment w/herbicide	Hand removal. May include cut stem.	
EQUIPMENT:	Tank sprayer where possible, backpack sprayer where necessary.	Tank sprayer where possible, backpack sprayer where necessary.		
MATERIALS:	Escort 1/2 to 1 oz./acre	Milestone VM 5 to 7 oz./acre	None required. Round -up in spray bottle for cut stem.	Flea beetle/Cinnabar Moth
TIMING:	Spray by May	Spray by June	Pull by June	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary. Seed and fertilize to reduce weed competition.	
REMARKS:				

Noxious Weed Control - Wild Chervil

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.		
MANAGEMENT GOALS:	Eradication and control of noxious weeds.	Eradication and control of noxious weeds.		
METHOD:	Spot treatment w/ herbicide.	Spot treatment w/ herbicide.		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer	Truck mounted sprayer where possible, backpack sprayer		
MATERIALS:	2 oz./acre Escort and 7oz./acre Milestone VM	1-3 oz./acre Telar DF		
TIMING:	Prebloom April/May	Apply early post emergence to actively growing plants		
IVM FOLLOW-UP:	Repeat as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary		
REMARKS:	Reportedly, it tolerates 24-D			

Nuisance Weed Control - Scotch broom

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Manual application	Mechanical application	Bio-Control
ACTION THRESHOLD:	Whenever new infestations occur (dependant on available resources)	Wherever present (dependant on available resources)	When resources are available.	When ever present
MANAGEMENT GOALS:	Minimize populations and prevent further spread of weed.	Minimize populations and prevent further spread of weeds.	Minimize populations and prevent further spread of nuisance weeds.	Minimize spread
METHOD:	Foliar treatment w/herbicide.	Hand pull	Mechanical control with follow-up cut stump treatment.	Bio-Control
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Weed wrench option, brown brush monitor	Mower, backpack sprayer where necessary.	Truck
MATERIALS:	Garlon 3A at 2 quartz with Escort 2 oz. with Phase per acre	Garlon 4 mix 2 to 1 with crop oil	Garlon 3A at 1 to 1 with water or surfactant	Exapionfuscirostre
TIMING:	Apply during actively growing season	Anytime	After mowing	release when actively growing.
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize or plant to restore native plant community.	Reapply as necessary. Seed and fertilize or plant to restore native plant community.	Re-cut/treat as necessary. Seed and fertilize or plant to restore native plant community.	Evaluate, redeploy if necessary
REMARKS:				

Nuisance Weed Control - Himalayan Blackberry

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Mechanical application		
ACTION THRESHOLD:	Whenever present (dependant on resources)	When resources are available.		
MANAGEMENT GOALS:	Control and eradicate if county requires.	Minimize populations and prevent further spread of weed.		
METHOD:	Foliar treatment w/ herbicide	Mechanical control with follow-up cut stump treatment.		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Mower or hand labor, backpack sprayer or spray bottle where necessary.		
MATERIALS:	Krenite 1.5-6 gallons/acre	Crossbow 1.25-1.5 gallons/acre		
TIMING:	In the Fall, after berries drop.	After mowing, in the fall.		
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize or plant to restore native plant community	Re-cut/treat as necessary. Seed and fertilize or plant to restore native plant community.		
REMARKS:				

Nuisance Weed Control - Knotweed sp.

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Stem injection		
ACTION THRESHOLD:	Whenever present (dependent on available resources)	Smaller infestations and or near water		
MANAGEMENT GOALS:	Eradication and control only if your county requires.	Eradication and control only if your county requires.		
METHOD:	Spot treatment w/ herbicide	Stem injection w/ herbicide		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Injection equipment		
MATERIALS:	Habitat/MSO 0.5-1 lbs. per acre	Concentrated Roundup at 2%		
TIMING:	Early to late bloom between July and August	Once seasonal growth has occurred		
IVM FOLLOW-UP:	Reapply if necessary following year. Restore site w/ native vegetation.	Re-treat green stems as necessary. Restore site w/ native vegetation		
REMARKS:				

Nuisance Weed Control - Canada Thistle

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	Bio-Control
ACTION THRESHOLD:	Wherever present	Wherever present	Wherever present	Wherever present
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.
METHOD:	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	
MATERIALS:	Transline at 2/3 - 1 1/3 pint/acre	Milestone VM 5-7 oz./acre	Telar XP 1-3 oz./acre	Rhinocyllus Conicus
TIMING:	Apply from rosette to bud stage to actively growing thistle	Pre bud stage	Apply to the bud at bloom stage	Early growing season
IVM FOLLOW-UP:	Repeat annually as necessary	Apply before first frost	Apply before first frost	Redeploy as needed
REMARKS:	For most effective control, apply as a broadcast treatment to the entire infested area.			

Nuisance Weed Control - Bull Thistle

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	Bio-Control
ACTION THRESHOLD:	Wherever present	Wherever present	Wherever present	
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.
METHOD:	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	Bio-Control
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	
MATERIALS:	Transline at 2/3 - 1 1/3 pint/acre	Milestone VM 3 to 5 oz. per acre	Telar XP 1-3 oz./acre	Urophora Stylata
TIMING:	Apply from rosette to bud stage to actively growing thistle	Apply to young actively growing weeds.	Apply to young actively growing weeds.	Early growing stage
IVM FOLLOW-UP:	Repeat annually as necessary	Repeat annually as necessary	Repeat annually as necessary	Reapply as necessary
REMARKS:				

Nuisance Weed Control - Common Fennel

	OPTION 1			
TREATMENT TYPE:	Chemical application			
ACTION THRESHOLD:	Wherever present			
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.			
METHOD:	Foliar treatment w/ herbicide			
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.			
MATERIALS:	Escort 1/3 to 1/2 oz./acre			
TIMING:	Apply from rosette to bud stage to actively growing thistle			
IVM FOLLOW-UP:	Repeat annually as necessary			
REMARKS:				

Nuisance Weed Control - Common Teasel

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	Wherever present	Wherever present		
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.		
METHOD:	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.		
MATERIALS:	Milestone VM 4 to 7 oz./acre	Milestone VM plus 4 to 6 oz./acre		
TIMING:	Apply from rosette to bud stage to actively growing thistle	Apply from rosette to bud stage to actively growing thistle		
IVM FOLLOW-UP:	Repeat annually as necessary	Repeat annually as necessary		
REMARKS:				

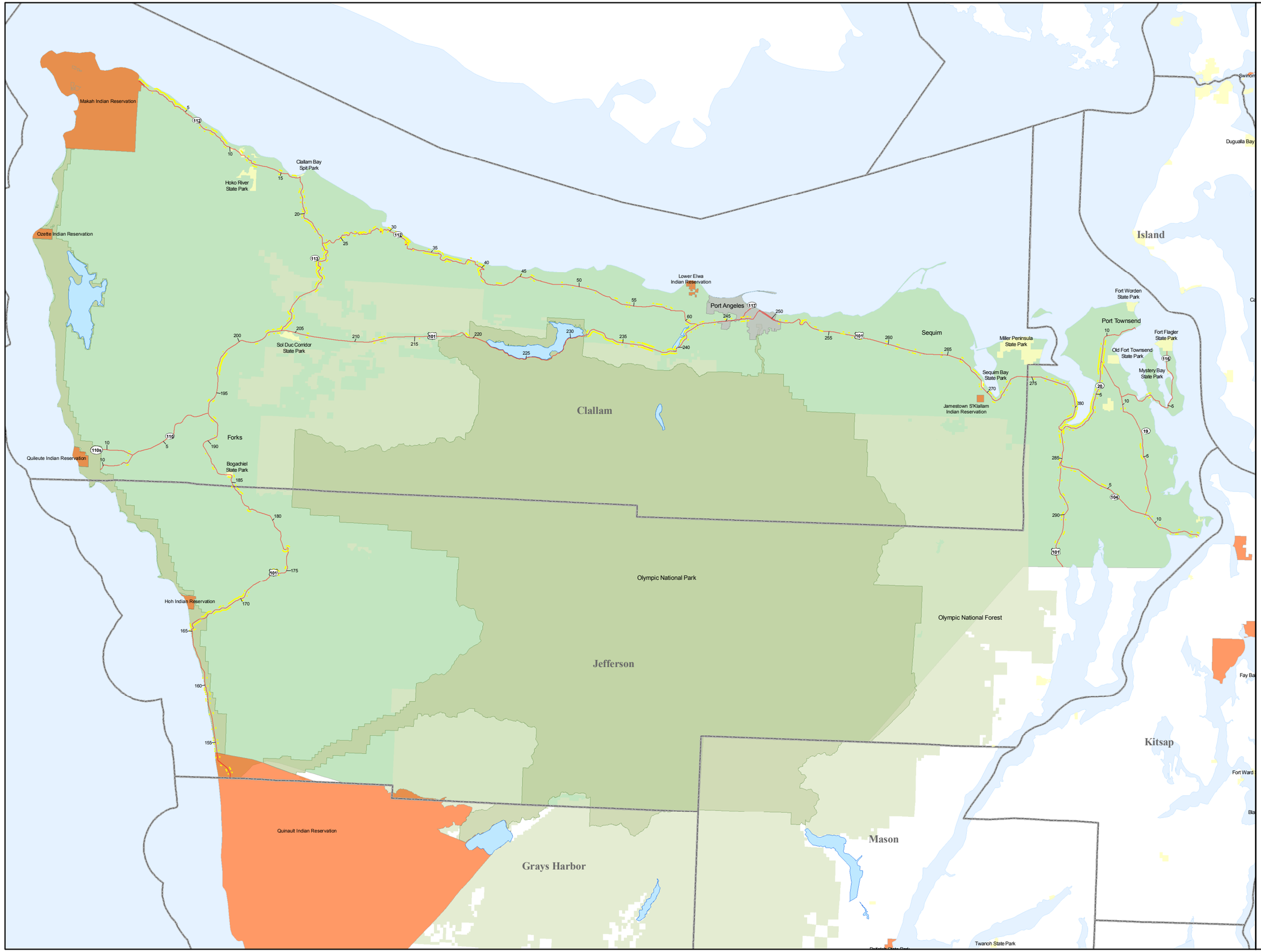
Herbicides Approved for Use on WSDOT Rights of Way

When making herbicide applications:
1. Always read and follow product labels
2. Always use personal protective equipment when mixing, loading, and applying

Chemical Name	***Product Name(s)***	***Where Used***	***How/Why Used***	***Notes/Recommendations***	***Restrictions***	***Cautions***
2,4-D	Weedar 64 Amine 4 Veteran 720 Curtail WeedDestroy Platoon Crossbow Escalade Weedmaster Solution Savage Weedone LV4	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	Ester and acid formulations of 2,4-D may provide a good alternative to amine formulations. A number of the 2,4-D products come premixed with other herbicides.	Amine formulations of 2,4-D are restricted for use within 60' of all water	Amine formulations cause irreversible eye damage and are highly toxic to rainbow trout. All 2,4-D products pose risks when applied near grapes and other sensitive crops.
Bromacil	Krovar 1 DF Hyvar	Zone 1	Nonselective pre-emergent grass and weed control	Krovar and Hyvar are premixed with diuron	Westside - Restricted for use Eastside - Krovar restricted for use within 60' of all water	Bromacil is potentially mobile in soil, use caution if rain is possible.
Bromoxynil	Buctril 2EC BroClean Brox 2E	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Effective broadleaf weed control without grass seed suppression	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly toxic to fresh water fish
Chlorsulfuron	Telar XP Landmark XP	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Product highly effective on Canadian thistle and horsetail. Landmark is premixed with Oust.	None	None
Clopyralid	Transline Curtail Pathfinder	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Curtail is premixed with 2,4-D, Pathfinder is premixed with triclopyr	Curtail and Pathfinder are restricted for use within 60' of all water because of mixture with other restricted herbicides.	Curtail contains 2,4-D amine which causes irreversible eye damage and is highly toxic to rainbow trout
Dicamba	Vanquish Veteran 720	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	Vanquish is the dicamba formulation without 2,4-D	Veteran 720 is restricted for use within 60' of all water because of 2,4-D amine content	Veteran 720 contains 2-4-D amine which causes irreversible eye damage and is highly toxic to rainbow trout
Dichlobenil	Norosac 4G Casoron	Ornamental planting beds	Pre-emergent weed control in ground cover beds. Post emergent control of grasses.	Highly effective for pre-emergent control of unwanted weeds in ornamentals	Restricted for use within 60' of all water	Dichlobenil is highly toxic to aquatic insects
Diflufenzopyr	Overdrive	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	None	None	None
Diuron	Karmex Diuron 4 L Diuron 80 DF	Zone 1	Nonselective pre-emergent grass and weed control	Cost effective weed control for Zone 1 in Eastern Washington	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly toxic to fish.
Flumioxazin	Payload	Zone 1	Nonselective pre-emergent grass and weed control	Second year of use in zone 1, still evaluating	Restricted for use within 60' of all salt water	Highly toxic to estuarine invertebrates
Fluroxypyr	Vista	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	None	None	Highly toxic to Eastern Oyster, high surface runoff potential
Fosamine	Krenite S	Tree and brush control in Zones 2 & 3	Selective broadleaf treatment	Effective broadleaf tree control without visual impacts	None	None
Glyphosate	Roundup Pro Razor Pro Buccaneer Aquaneat Rodeo Aquamaster	Zone 1, spot spray around shrub and tree plantings, aquatic weed control (Rodeo, Aquamaster)	Nonselective control of all vegetation	Rodeo, Aquamaster and Aquaneat are approved for use in or over water. Aquatic versions of glyphosate products are approved for use with NPDES permit.	None	None
Imazapyr	Arsenal Habitat	Zone 1	Pre and post-emergent non-selective control of all vegetation	Habitat is an aquatic version of Arsenal - good alternative to glyphosate in certain cases	None	High surface runoff potential, potentially mobile in soil if rain is possible.
Isoxaben	Gallery 75DF	Turf & Ornamental	Pre-emergent weed control in ground cover beds	Works well by itself or with Ronstar	Restricted for use within 60' of all water	High surface runoff potential
Metsulfuron-methyl	Escort XP Metsulfuron Methyl 60 DF	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf and conifer treatment	None	None	None
Norflurazon	Predict	Zone 1	Pre-emergent Weed control in Zone 1 and ground cover beds	Good Zone 1 product but may be difficult to keep in suspension	Restricted for use within 60' of all water	High surface runoff potential
Oryzalin	Oryzalin A.S. Surflan A.S	Zone 1 Ornamental planting beds	Pre-emergent Weed control in Zone 1 and ground cover beds	Product requires additional rinsing to thoroughly remove residues from empty container	Restricted for use within 60' of all water	Highly toxic to fish
Oxadiazon	Ronstar G Ronstar WSP	Turf & Ornamental	Pre-emergent weed control in ground cover beds	Works well by itself or with Gallery	Restricted for use within 60' of all water, gardens, plants bearing edible fruit	Highly toxic to fish
Pendimethalin	Pendulum 2G Pendulum Aqua	Zone 1 Turf & Ornamental	Nonselective Pre-emergent grass and weed control	None	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly toxic to fish, high potential for loss on eroded soil
Picloram	Tordon	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Highly effective for conifer and broadleaf weed control in Eastern Washington	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly mobile in soil and readily adsorbed through roots of desirable trees
Pyraflufen	Edict	Noxious and nuisance weed control, Zones 2 and 3	2,-4-D substitute, effective on Kochia, Russian thistle	Effective with Roundup for Kochia control	Restricted for use within 60' of all water	Irreversible eye damage, highly toxic to Rainbow Trout
Sulfentrazone	Portfolio	Zone 1	Nonselective pre-emergent grass and weed control	New product available for use in 2006	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	High surface runoff potential, potentially mobile in soil if rain is possible.
Sulfometuron-methyl	Oust Landmark XP	Zone 1	Nonselective pre/post emergent grass and weed control	Landmark is premixed with Telar	None	None
Tebuthiuron	Spike 80DF	Zone 1	Nonselective pre-emergent grass and weed control	None	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	High surface runoff potential, potentially mobile in soil if rain is possible.
Triclopyr Amine	Garlon 3A	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	None	None	Irreversible eye damage
Triclopyr Ester	Garlon 4 Crossbow Pathfinder	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	Works well for invert applications. Crossbow is premixed with 2,4-D, Pathfinder with clopyralid	Restricted for use within 60' of all water	Highly toxic to fish

Appendix C:

Olympic Region Area 3
Zone 1 Maintenance
Map 1 of 1



Legend

- Zone 1
- 75 Mile Post
- State Route
- State Park
- County Boundaries
- Major Lakes
- Coast
- Cities
- Indian Reservations
- National Park
- National Forest
- OL area 3

0 10
Miles

N

Washington State Department of Transportation

2009

Noxious Weed Identification

Designated for control in Olympic Region area 3:
(Jefferson and Clallam County)

Giant Hogweed/
Heracleum mantegazzianum

European Hawkweed/
Hieracium sabaudium

Dalmation Toadflax/
Linaria dalmatica

Hoary alyssum/
Berteroa incana

Meadow Knapweed/
Centaurea jacea

Orange Hawkweed/
Hieracium aurantiacum

Noxious Weed Identification

Designated for control in Olympic Region area 3:
(Jefferson and Clallam County)

Poison Hemlock/
Conium maculatum

Common reed/
Phragmites australis

Purple loosestrife/
Lythrum salicaria

Spotted Knapweed/
Centaurea stoebe

Sulfur cinquefoil/
Potentilla recta

Tansy Ragwort/
Senecio jacobaea

Noxious Weed Identification

Designated for control in Olympic Region area 3:
(Jefferson and Clallam County)

Wild chervil/
Anthriscus sylvestris

Yellow Hawkweed/
Hieracium caespitosum

Nuisance Weed Identification

Nuisance weeds in OL area 3:
(Jefferson and Clallam County)

Scotch Broom/
Cytisus scoparius

Himalayan Blackberry/
Rubus discolor

Japanese Knotweed/
Polygonum cuspidatum

Canada Thistle/
Cirsium arvense

Bull Thistle/
Cirsium vulgare

Common fennel/
Foeniculum vulgare

Nuisance Weed Identification

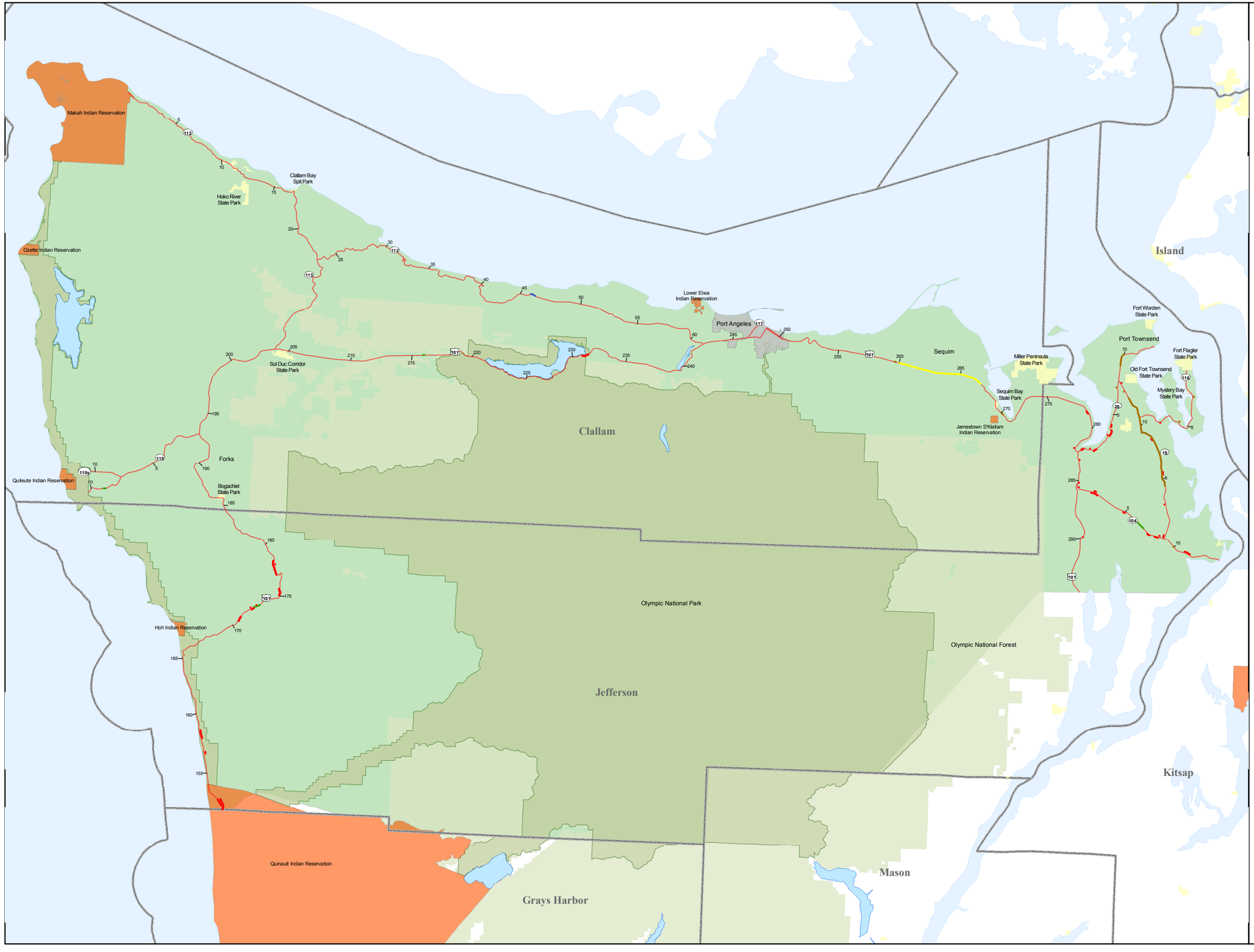
Nuisance weeds in OL area 3:

(Jefferson and Clallam County)

Common teasel/
Dipsacus fullonum

Appendix D:

Olympic Region Area 3
Noxious Weed Locations
Map 1 of 2



Legend

- Diffuse Knapweed
- Meadow Knapweed
- Poison Hemlock
- Tansy Ragwort
- Yellow Hawkweed
- 75 Mile Post
- State Route
- State Park
- County Boundaries
- Major Lakes
- Coast
- Cities
- Indian Reservations
- National Park
- National Forest
- OL area 3

0 8
Miles

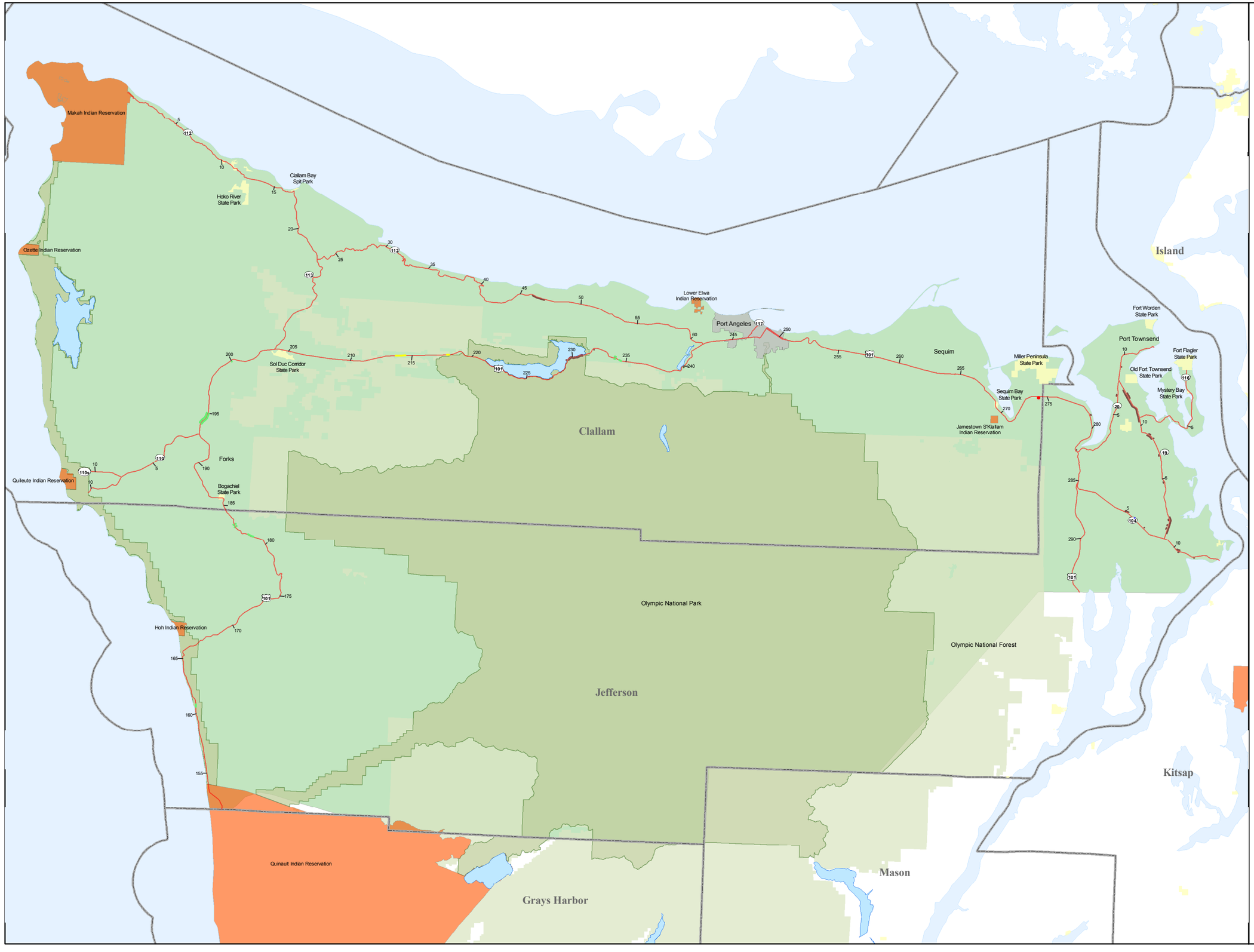
N

Washington State Department of Transportation

2009

Appendix D:

Olympic Region Area 3
Noxious Weed Locations
Map 2 of 2



Legend

- European Hawkweed
- Giant Hogweed
- Knapweed
- Orange Hawkweed
- Purple Loosestrife
- 75 Mile Post
- State Route
- State Park
- County Boundaries
- Major Lakes
- Coast
- Cities
- Indian Reservations
- National Park
- National Forest
- OL area 3

0 8
Miles

N

Washington State Department of Transportation

2009

Table 3.0

Locations are distinguished between the sides of the highway by right shoulder (RS) or left shoulder/median (LS) in relation to either increasing (INC) mile markers or decreasing (DEC) mile markers

Description - Brief explanation of special treatment required

SR	Direction	Shoulder	BEG MP	END MP	Type	Description
020	Both	RS	9.78	12.56	City of Port Townsend	Maintain by city
101	INC	RS	264.28	265.03	I/C Sequim Ave.	
101	INC	RS	262.72	263.52	I/C Trucker Rd.	
101	INC	RS	261.26	261.27	Matrioti Creek	Mitigation Site
101	INC	RS	152.38	152.39	Queets River	Mitigation Site
101	DEC	RS	266.46	266.12	Off Ramp	
101	DEC	RS	264.86	264.16	I/C Sequim Ave.	
101	DEC	RS	263.57	262.66	I/C Trucker Rd.	
101	Both	RS	265.00	267.74	Cityof Sequim	Maintain by city
101	Both	RS	263.75	264.82	City of Sequim	Maintain by city
101	Both	RS	246.74	249.89	City of Port Angeles	Maintain by city
101	Both	RS	245.97	246.10	City of Port Angeles	Maintain by city
101	Both	RS	219.20	231.36	Lake Crescent SMA/OL Nat. Park	No Spray Area
101	Both	RS	189.69	193.31	City of Forks	Maintain by city
101	Both	RS	154.10	166.75	Olympic National Park	No Spray Area
101			238.76		Elwha Maintenance Storage Site	
101			253.00		Deer Park Pit Site	
101			269.21		Sequim Pit Site	
101			192.30		Calawah Pit Site	
101			219.50		Fairholm Quarry Site	
101			238.60		Elwha Stockpile Site	
101			208.50		Muscoccetti Pit Site	
101			164.80		Ruby Beach Stockpile Site	
101			170.50		Nolan Cr. Stockpile Site	
101			292.70		Lords Lake Pit Site	
101			183.90		Pit Site (Y14)	
104			6.00		Shine South Stockpile Site	
104			10.00		Shine North Sand Storage Site	
110	Both	RS	0.00	0.16	City of Forks	Maintain by city
112	Both	RS	59.84	60.32	Elwha River SMA	No Spray Area
112	Both	RS	50.29	51.44	Joyce/Crescent School SMA	No Spray Area
112	Both	RS	45.78	46.38	Lyre River/Susie Creek SMA	No Spray Area
112	Both	RS	38.15	39.01	Twin Rivers SMA	No Spray Area
112	Both	RS	34.66	35.48	Deep Creek SMA	No Spray Area
112	Both	RS	0.00	0.63	Makah Indian Reservation	
112			16.98		Clallam Bay Stockpile Site	
112			23.00		Burnt Mt Jct. Stockpile Site	
112			58.90		Place Pit Site	

Table 3.0

Locations are distinguished between the sides of the highway by right shoulder (RS) or left shoulder/median (LS) in relation to either increasing (INC) mile markers or decreasing (DEC) mile markers

Description - Brief explanation of special treatment required

SR	Direction	Shoulder	BEG MP	END MP	Type	Description
112			39.50		Twin Pit Site	
116	Both	RS	0.00	9.83	Entire State Route - Sensitive Area	No Spray Area
117	Both	RS	0.00	1.40	City of Port Angeles	Maintain by city

Washington State Department of Transportation

Integrated Vegetation Management Record

Org Code	County	Date		Vegetation Management Zone(s)
		6/13/2007		☐ Zone 1 ☐ Zone 2 ☐ Zone 3

Area
SR. _____ MP _____ to MP _____ Location

Check Appropriate Boxes:
☐ NB ☐ EB ☐ SB ☐ WB
☐ Roadside ☐ Shoulder ☐ Median
☐ Landscaped Area ☐ Rest Area ☐ Park-n-Ride
☐ Interchange ☐ Bridge ☐ Ramp
☐ Mitigation Site ☐ Stormwater ☐ Yard/Stockpile
Third Party Damage ☐ Yes
Sensitive Sites ☐ Aquatic ☐ Wetlands

Target ☐ Noxious Weeds ☐ Brush/Trees ☐ Other ☐ Nuisance Weeds ☐ Hazard Tree
List Target/Species: _____

Reason for Action:
☐ Noxious Weeds ☐ Nuisance Weeds ☐ Fire Prevention ☐ Restore Native Veg. ☐ Zone 1 Pilot ☐ Aesthetic
☐ Site Distance ☐ Hazard Vegetation ☐ Customer Request ☐ Enhance Vegetation ☐ Slope Stabilization ☐ Other _____

Long term IVM plan (Describe goals/objectives and a step-by-step approach over time)

Approximate Acres to Accomplish

Activities		Planned date of Treatment	Actual date of Treatment
Manual	☐ Digging ☐ Pulling ☐ Planting ☐ Lopping ☐ Scalping ☐ Other _____		
Mechanical	☐ Aerial Saw Work ☐ Tractor Brush Cutter ☐ Mower/Chain ☐ Manual Brush Cutting ☐ Tractor Mower ☐ Other		
Bio-Control	☐ Insect ☐ Pathogens ☐ Parasite Type/Species _____		
Cultural	☐ Burning ☐ Grading ☐ Seeding ☐ Fertilizing ☐ Grazing ☐ Soil Amendment ☐ Other _____		
Chemical	Record Number		

#1 Evaluation and Date

#2 Evaluation and Date

#3 Evaluation and Date

Pesticide Application

Org. Code	County	Date of Application	Start / Finish	ICP	Stores Issue Ticket Number(s)
		6/13/2007	○ AM ○ PM / ○ AM ○ PM		

Area
SR ____ MP ____ to MP ____ and MP ____ to MP ____ and MP ____ to MP ____ and MP ____ to MP ____

Check Appropriate Boxes:
☐ NB ☐ EB ☐ SB ☐ WB
☐ Roadside ☐ Shoulder ☐ Median ☐ Landscaped Area ☐ Rest Area ☐ Park-n-Ride ☐ Interchange ☐ Bridge ☐ Ramp ☐ Yard/Stockpile
☐ Spot Spray ☐ Blanket Spray
☐ Aquatic ☐ Wetlands

☐ Weeds ☐ Noxious Weeds ☐ Disease
☐ Brush ☐ Insects ☐ Other
Zone 1 ○ **yes** ○ **no**
List Pest(s):

Start Weather Conditions
Temperature ____ (°F / °C) Wind (Direction From) ____ Wind (Range) ____ mph(km/h)
○ Sunny ○ Broken ○ Overcast No Rain ○ Light Scattered Showers ○ Hard Showers

Finish Weather Conditions
Temperature ____ (°F / °C) Wind (Direction From) ____ Wind (Range) ____ mph(km/h)
○ Sunny ○ Broken ○ Overcast No Rain ○ Light Scattered Showers ○ Hard Showers

Tank No.	Material Name	Material Type	EPA Reg. No.	Lot Number	Product Per Acre (hectare)	Unit	Total Daily Usage	Unit

Total ____ **Acres(hectares) Treated at** ____ **gallons(liters) of spray per acre(hectare).**

Equipment Number	Tank Size 1	2	3	4	5	Calibration Date	Vehicle Speed mph(km/h)	Nozzle Pressure PSI(kPa)	Width of Spray Pattern Feet(meter)

☐ Hand/spreader ☐ Backpack ☐ Hand gun ☐ Fixed Nozzle ☐ Boom ☐ Other (Specify) ____
☐ Tank Mix (Conv.) ☐ Injection ☐ Invert

Operator Name	Operator Pesticide License No.	Operator Signature	Driver Name

Remarks

Buffer Truck Driver's Name

Pesticide Sensitivity Registration Applies: ☐ Yes ☐ No

Contact

Division of Emergency Management (1-800-258-5990) Additional Notes

DOT Form 540-506 EF Revised 1/2007
Distribution: OIC Maint. Operator Region File
Send OSC Copy Within 5 Days

Osl= Ounces Dry Lb= Pound
Osl= Ounces Liquid Ga= Gallon
Pt= Pint Qt= Quart
g= gram kg=kilogram
ml=Milliliter L= Liter

Entity	Mailing Address	Contact Person	Title	Phone	E-Mail
City of Forks	500 East Division St. Forks, WA 98331	David Zellar	Public Works Director	(360)374-5412 Ext. 242	
City of Port Angeles	321 East 5th St. Port Angeles, WA 98362	Glenn Cutler	Public Works Director	(360) 417-4801	publicworks@cityofpa.us
City of Sequim	615 N. 5th Ave. Sequim, WA 98382	James Bay	Public Works Director	(360) 683-4908 Ext. 434	jbay@ci.sequim.wa.us
City of Port Townsend	250 Madison St. Suite 2R Sequim, WA 98368	Kenneth Clow	Public Works Director	(360) 385-7212 Fax (360) 385-7675	kclow@cityofpt.us
Makah Indians	P.O. Box 115 Neay Bay, WA 98357		Makah Tribal Council	(360) 645-2201	makah@centurytel.net
Quinault Indians					
Olympic National Park	600 East Park Ave. Port Angeles, WA 98362			(360) 565-3130	
Olympic National Forest	353 South Shore Rd. Quinault, WA 98575		Pacific Ranger District	(360) 288-2525	
Clallam County	223 E. 4th, Suite 15 Port Angeles, WA 98362	Cathy Lucero	Noxious Weed Coordinator	(360) 417-2442 Fax (360)417-2414	clucero@co.clallam.wa.us
Jefferson County	201 W Patison Port Hadlock, WA 98339	Jeff Gabster	Noxious Weed Coordinator	(360) 379-5610 Fax (360) 379-5617	noxiousweeds@co.jefferson.wa.us